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TOOL ORGANIZER

by

EDWARD G. GUIRLINGER

Calfee, Halter & Griswold LLP

Attorneys at Law

21 EAST STATE STREET
COLUMBUS, OH 43215-4243
TELEPHONE (614) 621-7101
FACSIMILE (614) 621-0010

Background of the Invention

Field of the Invention

The present invention relates generally to portable tool boxes, chests, containers and organizers for storing, transporting and organizing sets of tools. Specifically, the present invention relates to a wheeled tool organizer having vertical tool supports which may be disposed in an open or closed configuration, facilitating a visual inspection of all tools when disposed in the open configuration.

Description of the Related Art

Portable tool boxes and tool cabinets are well known for storing and transporting tool sets. For example, U.S. Patent Number 5,378,005 describes a portable tool truck invented by George Norton. The '005 device comprises a plastic body with a compartment formed in the front face of the body adapted to retain tools therein, and two doors mounted on either side of the body. The doors pivot in opposite directions into an overlapping arrangement that seals off the compartment formed by the face of the body. While the invention of Norton is adequate for retaining and transporting tools, it does not facilitate taking a visual inventory of all of the tools retained therein. Further, the invention of Norton fails to provide a specific place for each tool of a tool set.

Summary of the Invention

Advantages of the Invention

The present invention provides numerous advantages and benefits over prior art tool organizers. Specifically, the present invention facilitates more efficient off-site maintenance activities by reducing the need for multiple trips due to lost or forgotten tools. The present invention provides a uniform standard for tool sets. The present invention further facilitates reduced theft, loss and inventory shrinkage.

It is another advantage of the present invention that it may be disposed in an open configuration to enable a visual inspection and inventory of tools stored within the tool organizer.

It is a further advantage of the present invention that the tool organizer includes a tool fastener and tool indicia for each specific tool of a particular tool set. This enables the owner or manager of a tool set to quickly visually inspect the contents of the tool organizer to determine whether the tool set is complete. Specifically, one may determine and precisely identify any missing tools.

According to a first aspect of the present invention, a first example tool organizer is provided. The tool organizer includes a frame and a plurality of wheels attached to the frame. The tool organizer also includes a tool storage structure supported by the frame. The tool storage structure comprises a plurality of storage panels. Each storage panel includes at least one tool fastener for securing a tool. The plurality of storage panels are movable with respect to one another between a closed configuration and an open configuration.

According to a second aspect of the present invention, a second example tool organizer is provided. The second example tool organizer is modular and includes a modular frame comprising a plurality of removably assembled frame components, and at least one tool module adapted to be removably attached to the modular frame. Each tool module comprises at least one tool fastener and at least one corresponding tool indicia associated with each tool fastener.

According to a third aspect of the present invention, a tool set transportation system is provided. The tool set transportation system includes a frame component, a travel base and at least one tool module. The frame is a portion of a modular frame. The travel base is adapted to support the frame component, and the tool module is adapted to be removably attached to the frame component.

According to a fourth aspect of the present invention, a tool bag is provided. The tool bag includes a plurality of tool fasteners and a means for attaching the tool bag to a tool organizer. Each tool fastener of the tool bag includes an associated tool indicia.

According to a fifth aspect of the present invention, a method for monitoring a tool set is provided. The method includes configuring a tool organizer, containing at least a portion of a tool set, in an open configuration. The method also includes visually inspecting the contents of the tool organizer to determine a first level of completeness of the tool set. The first level of completeness is recorded, and the tool organizer and its contents are released to a third party.

The method further includes receiving the tool organizer and returned contents from the third party, configuring the tool organizer in an open configuration and visually inspecting the returned contents of the tool organizer to determine a second level of completeness of the tool set. The second level of completeness is compared to the first level of completeness to determine whether one or more tools from the tool set are missing.

The objects, features and advantages of the present invention are readily apparent from the following description of the preferred embodiments when taken in connection with the accompanying drawings.

Brief Description of the Drawings

Comprehension of the invention is facilitated by reading the following detailed description, in conjunction with the associated drawings, in which:

FIG. 1 is a perspective view of a first example tool organizer disposed in a closed configuration in accordance with the present invention;

FIG. 2 is a perspective view of the tool organizer of FIG. 1 disposed in an open configuration;

FIG. 3 is a front view of the tool organizer of FIG. 1;

FIG. 4 is a side view of the tool organizer of FIG. 1;

FIG. 5 is a rear view of the tool organizer of FIG. 1;

FIG. 6 is a front view of the tool organizer of FIG. 1;

FIG. 7 is a perspective view of the tool organizer of FIG. 1 with a storage drawer removed;

FIG. 8 is a plan view of the tool belt of the tool organizer of FIG. 1;

FIG. 9 is a perspective view of the tool belt of the tool organizer of FIG. 1;

FIG. 10 is a perspective view of a second example tool organizer in accordance with the present invention;

FIG. 11 is a perspective view of the tool organizer of FIG. 10 with a tool module removed;

FIG. 12 is a perspective view of the tool organizer of FIG. 10 with both tool modules removed;

FIG. 13 is an exploded view of a seat bracket and the upper frame of the tool organizer of FIG. 10;

FIG. 14 is a rear perspective view of the tool organizer of FIG. 10 with both tool modules removed; and

FIG. 15 illustrates the removable tool carrier of the tool organizer of FIG. 10.

Drawing Reference Numerals

The following reference characters identify the associated elements depicted in the drawings describing the present invention

100	Tool organizer	1022	Front wheel
110	Frame	1024	Storage box
112	Handle	1030	Tool support handle
114	Rear wheel	1032	Tool support retainer
116	Front wheel	1040	Tool fastener
118	Parts box	1042	Tool indicia
120	Load bearing step	1112	First tool module
124	Storage bin	1114	Second tool module
130	Vertical tool support	1116	Upper frame component
132	Retaining means	1118	Lower frame component
140	Tool fastener	1120A/B	Knob
142	Tool indicia	1122	Tool support
144	Tool	1124A/B	Bracket
150	Protrusion	1126A/B	Supporting cross-member
155	Retaining means	1202	Step
400	Tool belt	1204	Brake lever
410	Belt portion	1302	Travel base
412	First belt end	1304	Seat
414	Second belt end	1306	Seat belt
416	Pad	1308A/B	Prongs
418	Tool belt handle	1310A/B	Receptacles
420	Tool support	1402	Removable tool carrier
1000	Modular tool organizer	1404	Storage compartment
1012	Handle	1406	Handle
1014	Tray	1502	Handle
1016	Pin	1504A/B	Attachment hooks
1018	Hinge	1506	Shoulder strap
1020	Rear wheel		

Detailed Description of the Drawings

Referring now to the drawing figures, there is illustrated in Figure 1, a first example tool organizer **100** embodying the present invention. Tool organizer **100** is intended to contain a predetermined set of tools for use by a professional or hobbyist at a location within or away from a work shop. Tool organizer **100** comprises a frame **110** including a handle **112**. The frame **110** is supported by two rear tires **114** and two front casters **116**. The frame **110** supports several parts storage boxes **118** for containing miscellaneous tools, machine parts, work pieces and/or accessories that may be commonly needed by the user.

Tool organizer **100** includes a set of storage panels or vertical tool supports **130** for storing a specific set of tools. The specific set of tools may be selected based on the typical activities of the user. For example, the tool organizer **100** may be populated with a first set of tools for a plumber, a second set of tools for an electrician, or a third set of tools for a general maintenance worker. In the illustrated embodiment, each vertical support includes a rigid inner structure and an outer fabric covering which forms one or more tool fasteners **140** to

hold a tool **144**. Each tool fastener **140** has a specific size and shape so as to properly contain a specific tool **144** and includes a tool indicia **142** indicating the specific tool **144** which is associated with the tool fastener **140**. Each tool fastener **140** of the example tool organizer **100** is a pocket into which a specific tool **144** may be placed and stored. Of course, other types of tool fasteners **140** may be contemplated, such as loops, straps, velcro, and hooks, for example.

The tool organizer **100** may be disposed in a closed configuration, as illustrated in Figures 1, 3 and 4, or in an open configuration, as described more fully below with reference to Figures 2 and 6. The tool organizer may be disposed in the closed configuration by securing the vertical tool panels **130** using a panel retaining means **132**. In the illustrated embodiment, the panel retaining means **132** are straps that employ hook and loop fasteners, commonly referred to as velcro. Of course, retaining means of other types, including snap fasteners, buckles and hasps, for example, are acceptable substitutes.

Referring now to Figures 2 and 6, by releasing the retaining means **132**, the user can open the vertical tool panels **130** of the tool organizer **100**. This enables the user to visually detect every tool **144** of the particular tool set contained within the tool organizer **100**, and note any missing tools using the associated indicia.

According to one aspect of the present invention, a method is presented for using the example tool organizer **100** to facilitate an inspection and/or inventory process to efficiently determine a first level of completeness, i.e. to identify any missing tools from the set of tools. The method begins with disposing the tool organizer **100** in an open configuration and visually inspecting each tool fastener **140** to determine whether a tool **144** is disposed therein. The visual inspection further includes determining whether the each tool **144** disposed within a tool fastener **140** is associated with the tool indicia **142**. Preferably, the tool indicia **142** is a printed tool name, although it may be an alpha-numeric code or other indicia such as bar-code.

The method also includes recording the first level of completeness of the tool set, such as by noting the missing tools or tool indicia. The further includes releasing the tool organizer and contents to a third party and, at some future time, receiving the tool organizer **100** and returned contents from the third party. Again, the user configures the tool organizer **100** in an open configuration and visually inspects the returned contents of the tool organizer **100** to determine a second level of completeness of the tool set. The first and second levels of completeness are compared to determine whether one or more tools **144** from the tool set were not returned with the tool organizer **100**.

Referring now to Figures 4 and 5, respective side and rear views of the example tool organizer **100** are depicted. As illustrated, the tool organizer **100** includes an integrated tool belt **400** which may be detached from tool organizer **100** and used to carry a subset of the tool set apart from the tool organizer **100**. In an alternate embodiment of the present invention, the tool belt **400** may be replaced by a tool bag or tool box to maintain the same accountability as the tool organizer **100**.

Referring now to Figure 9, there is illustrated the tool belt **400** detached from the tool organizer **100**. Tool belt **400** includes a belt portion **410** having a first end **412** and a second end **414**. A retaining means **415** is disposed at belt end **414**. Tool belt **400** also includes a tool support **420** for holding the subset of tools and a handle **418**. Like the tool fasteners of the panels of the tool organizer **100**, each tool fastener of the tool belt has a particular size and shape to securely hold a specific tool, and each tool fastener of the tool belt **400** has an associated indicia of the specific tool to be stored.

When integrated with the tool organizer, the retaining means **415** of belt end **414** cooperates with a corresponding strap **155** attached to the tool organizer. Likewise, belt end **412** cooperates with a retaining means (not shown) also attached to the tool organizer **100**. The weight of the tools in the tool belt **400** is further supported by handle **418** which may be looped over a correspondingly place protrusion **150** formed within the frame **110** of tool organizer **100**.

When the tool belt **400** is not integrated with tool organizer **100**, retaining means **415** may cooperate with belt end **412** to form a loop which may be placed around a user's waist or over a user's shoulder, as illustrated in Figure 10. Tool belt **400** also includes a pad **416** to distribute pressure and provide a cushion for the user when the tool belt **400** is worn over the shoulder. Alternatively, the user may use handle **418** to carry tool belt **400**.

Modular Tool Organizer

There is illustrated in Figures 10 and 11, a second example tool organizer **1000** embodying the present invention. Tool organizer **1000** is particularly useful for professionals who may be required to supply a set of tools at a remote worksite. Modular tool organizer **1000** is designed to be easily placed in and removed from a passenger vehicle or truck. Modular tool organizer **1000** comprises four major components which may be disassembled to facilitate transportation and reassembled at a remote workplace. The four major components are a first tool module **1112**, a second tool module **1114**, an upper frame component **1116**, and a lower frame component **1118**.

Upper frame component **1116** includes a handle **1012** and a tray **1014**. Handle **1012** and tray **1014** are integrated into the upper frame **1116** by a hinge **1018**, and they may be adjusted to any of several positions using an adjustment mechanism, such as a spring-loaded pin **1016**. For example, handle **1012** may be positioned at a roughly 45 degree angle to accommodate moving and tilting the fully assembled tool organizer **1000**, as shown in Figures 10 and 11. Handle **1012** may be positioned horizontally, as illustrated in Figure 12, to serve as a work surface to hold tools or spare parts during a job. In yet another example, handle **1012** may also be positioned vertically to conserve space during transporting the components of the tool organizer **1000**, as illustrated in Figure 13.

Referring back to Figure 11, the two tool modules **1112** and **1114** attach to and are supported by the upper frame component **1116**. Tool module **1112**, for example, attaches to the upper frame **1116** using brackets **1124A** and **1124B** which engage corresponding cross-members **1126A** and **1126B** of the upper frame component **1116**. Each of the two tool modules **1112** and **1114** may be lifted and maneuvered using a tool support handle such as handle **1030**, and each includes two vertical tool supports, such as tool support **1122** of tool module **1112**. As in the first example embodiment, the vertical tool supports may be retained by tool support closure **1032**, and each vertical support includes one or more tool fasteners **1040** to hold a tool, and each tool fastener **1040** has a specific size and shape so as to properly contain a specific tool. Each tool fastener **1040** further includes a tool indicia **1042** indicating the specific tool which is associated with the tool fastener.

Lower frame component **1118** includes two rear wheels **1020** and two front casters **1022**. The lower frame component **1118** supports several parts storage boxes **1024** for holding various machine parts, work pieces and/or accessories that may be commonly needed by the user, but are typically not considered part of the tool inventory. Lower frame component **1118** includes two apertures for receiving two corresponding prongs **1308A** and **1308B** of upper frame component **1116**. When the upper frame component **1116** is received by lower frame component **1118**, the two may be secured by tightening corresponding knobs **1120A** and **1120B**. These attachment mechanisms enable the tool organizer **1000** to be assembled and disassembled as desired.

Referring now to Figure 12, tool organizer **1000** is illustrated with both tool modules **1112** and **1114** removed. The removal of the tool modules facilitates the use of step **1202** which is integrated into the lower frame component **1118**. The tool organizer **1000** may be stabilized using brake **1204** which prevents rotation of the rear wheels **1020**.

Referring now to Figure 13, there is illustrated a travel base **1302** which adapted to fit in a passenger seat of a car or truck, such as seat **1304**. Travel base **1302** may be secured to seat **1304** using a standard passive restraint, such as seatbelt **1306**. Travel base **1302** includes receptacles **1310A** and **1310B** which are adapted to receive corresponding prongs **1308A** and **1308B** of upper frame **1116**. Upon securing travel base **1302** to seat **1304** and attaching upper frame component **1116** to travel base **1302**, tool modules **1112** and **1114** may be attached to upper frame component **1116**. The modular nature of tool organizer **1000** enables the tool organizer to be easily inserted and removed from a car or truck. By breaking the tool organizer into several modules, the weight of the assembled tool organizer and its contents may be distributed over all of the modules, each of which may be more easily lifted and maneuvered.

Referring now to Figure 14, a rear perspective view of tool organizer **1000** is illustrated. As shown, the lower frame **1118** includes a rear storage compartment **1404**, saw horse support **1408** and a handle **1406**. Handle **1406** may be used to facilitate lifting the lower frame component **1118** into and out of a transporting vehicle. Saw horse support **1408** may be used to support a piece of wood or other workpiece to facilitate cutting the wood or other workpiece. A removable tool carrier **1402**, more clearly illustrated in Figure 15, is shown attached to the rear of tool organizer **1000**.

Removable tool carrier **1402** includes a handle **1502**, two attachment hooks **1504A** and **1504B** and an adjustable shoulder strap **1506**. Removable tool carrier **1402** further includes a plurality of tool fasteners. Each tool fastener has a specific size and shape so as to properly contain a specific tool. Each tool fastener further includes a tool indicia indicating the specific tool which is associated with the tool fastener.

Method for Using Tool Organizer

Referring now to Figure 16, there is illustrated an example methodology for using the example tool organizer to track, maintain and account for a set of tools which may be checked out to a third party for use. Examples of such third parties include, for example, in-house maintenance personnel and independent contractors. At block **1605**, the methodology includes configuring the tool organizer in an open configuration. By so configuring the tool organizer, every tool retained therein may be visually inspected (**1610**) by flipping through the vertical tool supports, similar to leafing through the pages of a book.

Upon or during the visual inspection, a level of completeness of the tool set is recorded (**1615**). The level of completeness may be any of a number of representations of the

tool set, including a list of tools missing from the tool set, a list of tools present in the tool set, a grade according to a predetermined scale, or a set of check marks in an inventory list, for example. At block 1620, the tool organizer may be checked out or released to the third party for use.

Once the third party returns the tool organizer (1625), the contents are once again visually inspected to determine a level of completeness at the time of check-in (1630). The first and second levels of completeness are then compared to determine any changes in the tool set (1635). Appropriate actions may be taken by the owner of the tool set based on any changes to the tool set. For example, the third party may be charged for any missing tools.

Although the invention has been described in terms of specific embodiments and applications, persons skilled in the art can, in light of this teaching, generate additional embodiments without exceeding the scope or departing from the spirit of the claimed invention. Accordingly, it is to be understood that the drawing and description in this disclosure are proffered to facilitate comprehension of the invention, and should not be construed to limit the scope thereof.